Comparison of VueCentric to the CPRS

This document provides a comparison of the Veterans Health Administration's (VHA's) electronic medical record system called the Computerized Patient Record System (CPRS) and Clinical Informatics Associate's (CIA's) product entitled VueCentric.

VueCentric is not an end user application, like CPRS, but is a framework that supports graphical user interface (GUI) development in the Mumps environment (MSM, DSM or Cache). Evolving from work originally funded by the VHA, VueCentric is a framework that supports the deployment of clinical functionality as a collection of discrete, but visually and operationally integrated, components. The suite of currently available components encompasses all of the functionality of CPRS and provides additional features not present in CPRS. VueCentric presents some compelling advantages for the IHS, which are discussed in detail below, along with the realized disadvantages.

VueCentric has been endorsed by the Information Systems Advisory Council (ISAC), and was also recommended by a clinical workgroup and technical workgroup that met to evaluate the GUI alternatives.

VueCentric Advantages for the IHS

The VueCentric architecture has many advantages for the IHS. The IHS faces critical and immediate needs in the areas of providing GUI applications for clinicians, deploying new and enhanced software functionality, and taking advantage of many of the excellent package advancements developed by the VHA and commercial vendors. CPRS provides much of the desired electronic medical record functionality needed in the IHS, but requires complete uniformity to the VHA's VistA environment. At present, the IHS RPMS environment has significant differences that prohibit the ability to seamlessly implement the CPRS, and given the continuing specialized needs of the IHS, wholesale conversion to the VistA is neither advisable nor practical.

Compared to the CPRS, VueCentric is a product that:

- Greatly exceeds the capability of CPRS
- Meets the diverse needs of the IHS
- Is extensible to include future technology
- Can be deployed in a reasonable time frame
- Has a highly favorable cost-benefit ratio

VueCentric not only provides the IHS with the capability to selectively implement key CPRS functionality, but also to compliment it with internally developed functionality that meets specific IHS needs. This is possible because VueCentric is a framework that supports building an application from discrete components that coexist in a customizable container and provides a comprehensive set of components and services for handling security and data access to the RPMS. Overall, VueCentric is a very rich and powerful development framework that will allow IHS to rapidly develop GUI applications.

Availability For Rapid Deployment

VueCentric requires little additional development effort to make it usable immediately within the IHS. A VueCentric minimal build package has already been developed for the IHS, which is compatible with the existing RPMS infrastructure, and does not require the latest versions of Fileman, or other CPRS-required packages.

The VueCentric model has a proven track record and many of the objects and component services needed by the IHS already exist. In addition, many of the core infrastructure services, such as component support, alerts, unified electronic signature, and interobject communication protocols are provided as part of the VueCentric architecture. This approach makes object development much less complicated and faster, supporting the need for rapid product deployment.

GUI Interface

The VueCentric model has an existing Windows-based graphical user interface for the RPMS host system that can be deployed today. This interface is highly configurable and easily modified to suit user preferences. The underlying RPC broker technology is robust and proven and compatible with similar technology currently in use within IHS.

Because many of the components available under VueCentric are derived from CPRS, the look-and-feel of CPRS may be maintained to the extent desirable. This can be important from the standpoint of training and also enables end users to enjoy the benefits of extensively field-tested user interface design. On the other hand, the configurability of VueCentric permits controlled customization of the user interface where required to meet institutional and/or user needs.

Integration With Newer VistA Packages

The VueCentric model will allow the IHS to adopt all the latest VistA packages for use within the RPMS environment and within the VueCentric user interface as well. These package upgrades include physician order entry, pharmacy, bar code medication administration, and patient management. The basic VueCentric component services layer supports both VistA and RPMS packages as currently developed, so typically only modifications to the host system routines may be needed when deploying a newer package.

Object Model

The object model of VueCentric differs substantially from the approach used in CPRS, in which the user interface is a single monolithic application. With VueCentric, it becomes practical and cost effective to support changes in host system packages on the graphical user interface side. In addition, with VueCentric the IHS has the opportunity to develop graphical user interface objects for the many VistA and RPMS packages that currently are not supported under CPRS. Some of these packages include, for example, scheduling, Women's Health, medical procedures, and the VistA surgery package.

Objects for VueCentric can be developed at any level of the organization and in any Windows programming language that supports COM. This flexibility of VueCentric maximizes the delivery of new objects and minimizes the risk of dependence on one group within the organization for product development. In addition, the use of distributed architecture standards allows objects to be developed by independent groups within the organization.

Another important benefit of the VueCentric component architecture approach is that object development can occur in stages. Thus, a core IHS clinical product can be initially released, with new objects added incrementally.

Open Architecture

The VueCentric model encourages commercial off the shelf software (COTS) integration within the user interface and therefore the IHS can deliver requested COTS functionality to the field without the resources and time needed to internally develop such functions. In addition, many COTS products represent "best of breed" applications and could not be easily duplicated by our finite internal development resources.

CCOW support is also provided within the VueCentric platform. Utilizing a third-party CCOW context manager, CCOW-aware COTS products can share user, encounter, and patient contexts.

Host System Independence

The VueCentric architecture is inherently host system independent. This capability of VueCentric allows the IHS to develop new clinical packages based on an entirely different host platform, without having to completely rewrite or replace the existing RPMS systems. For example, a new scheduling package can be developed on a SQL database system running on a UNIX or NT platform. This new package would be visually and functionally integrated within the main VueCentric user interface, and communicate using the existing VueCentric component services infrastructure. Clinical users would not be affected by the different host systems.

Scalability

The VueCentric architecture has no inherent limitations of scale, and performance will depend primarily on the factors related to the host system and network infrastructure. VueCentric has been deployed at one large medical center within the VHA with hundreds of concurrent users.

Thin Client Environments

VueCentric is designed to operate in a thin client environment, such as Citrix Metaframe, with similar performance to a traditional client server application environment.

Long Term Viability and Life Cycle

Conventional software has an expected life cycle of 4 to 5 years. The modular design of VueCentric permits continued evolution and migration, but in a controlled and incremental fashion. This is beneficial to the IHS for planning and costing purposes. Because the model can be evolved during this life cycle, it can take advantage of new software technology, such as Microsoft's .NET framework. CIA is currently developing a .NET version of VueCentric, which will allow re-use of existing components yet provide a migration path for fully embracing the new technology.

Software Development Costs

The IHS can benefit from substantial prior research and development investments made by the VHA. Since the infrastructure is complete, development costs will be primarily in the area of the creation of IHS specific components.

VueCentric Disadvantages for the IHS

In order to stay abreast, with each new release of the CPRS an ongoing effort is required to update the new changes into the CPRS components. Although this is a tedious undertaking, it should not be that substantial of an effort to compare and apply the new code changes to the existing CPRS components. Hopefully, this activity will be minimized when the VHA moves to a more componentized, service-oriented environment with their proposed .NET rewrite.

VueCentric is a proprietary commercial product that requires a cost to license it. Clinical Informatics Associates has offered to license it to the IHS for one dollar per year in conjunction with a support and development contract, which may exceed what IHS cares to spend on the product. A consideration worth noting is that the commercial nature of the product may enable IHS to allow for an end user licensing process to help subsidize the support and development costs.

The following table compares and contrasts the capabilities of VueCentric with CPRS:

Feature	VueCentric	CPRS
RPMS Compatibility	The CPRS components that run in VueCentric have been tailored to be compatible with the RPMS environment. They have been optimized to fully interface with the PCC and be consistent with the IHS visit creation process.	Is not directly compatible with the RPMS, for example, it utilizes different tables for maintaining vitals and problems and has a different Health Summary system.
VHA Alignment	Encourages alignment with the VHA's infrastructure by making it an incentive to install the newest Vista packages in order to utilize selective CPRS components.	Requires complete alignment with the VHA infrastructure, in that all necessary Vista packages need to be installed and be fully patched.
Configurability	Extensive configuration options through component-specific property editors, server-side parameters, and using the built-in application designer.	Limited configuration options through client-based menus or server-side parameters.
Extensibility	Highly extensible through the creation of new plug-in components. Third-party products may be tightly integrated by creating component wrappers or more loosely coupled using the HL7 CCOW standard.	Very limited extensibility in the form of tool menus capable of launching external applications.
Adaptability	Because VueCentric is component-based, it is highly adaptable. Many components developed by CIA can be configured to function properly with both VistA and RPMS. Other more specialized components can be developed specifically for IHS needs. Additionally, the application can be configured to reflect the needs of specific user roles.	Since CPRS is a monolithic application, it is minimally adaptable to differing institutional requirements and differing user roles. Many of the business rules imbedded within the CPRS application are not appropriate for IHS.
Deployment	Because of its component-based design, component updates may be deployed separately. This allows for incremental updates and removes the need to orchestrate updates across unrelated functional components. This significantly shortens the development and deployment cycle.	Given the monolithic design of CPRS, deployment of a modification to one functional component requires redeployment of the entire application. Additionally, the monolithic design imposes the artificial requirement that changes to unrelated functional components must be coordinated,

		complicating the deployment process.
Functionality	CIA has incorporated all of the functionality provided by CPRS into VueCentric components, has developed many components that provide additional functionality not available within CPRS, and has provided features that support the IHS patient care model.	CPRS has extensive clinical functionality that is tailored to the care of veteran patients. Some business rules do not apply to IHS (e.g., patient identifiers, service-connected disabilities).
Context Management	Flexible internal context management services that allows components to initiate and react to context changes. External context management is provided using the HL7-sanctioned CCOW standard, allowing context sharing with commercial applications.	Very rudimentary context management using proprietary windows messaging. Only the CPRS application may change context.
Events	Subscribe/publish model for support of local and server-initiated events. Latter capability permits notification of client application of critical events, such as changes to the current patient's data.	No support for event management. There is no capability for notifying the CPRS application of external events of interest.
Asynchronous Remote Procedures	Infrastructure provides full support for issuing server requests asynchronously. This allows developers to perform lengthy server-side operations without forcing the application to wait for completion.	CPRS has limited support for issuing asynchronous server requests for its cover sheet views. The approach is ad hoc and not extensible.
User Choice	User can be given choice among multiple offerings for accomplishing the same task. For example, the user can be allowed to choose among several different clinical documentation tools.	Application design philosophy "What we give you is what you get." Limited configuration options mitigate this rigidity only slightly.
Collaborative Development	Open architecture, component-based design, and broad choice of development tools maximizes opportunities for collaborative development.	The closed, monolithic design of CPRS promotes monopolistic, not collaborative, software development.
Future Migration	The component-based design of VueCentric reflects industry trends in software design. Experience with	The monolithic design of CPRS limits options for migration to and incorporation of new technologies.

	the development of a .NET version of VueCentric underscores the ease with which migration to a new technology may occur and demonstrates that the migration may be done incrementally.	
Mobile and Web Application	VueCentric permits creation of configurations that can be tailored to the smaller form factors of mobile systems like PocketPCs and tablet-based computers. Additionally, components developed within the framework can also be deployed in a web environment.	CPRS cannot adapt to many of the specialized requirements of mobile computing platforms and is not adaptable to the web environment.
Framework	It should be emphasized that VueCentric is an application-agnostic development framework that provides opportunities for developing new clinical and administrative software upon a common infrastructure.	CPRS is a closed architecture with a fixed and minimally extensible feature set.
Data Integration	VueCentric is fully capable of integrating data from VistA/RPMS with that derived from other sources (e.g., an SQL database or COTS system).	CPRS is designed to utilize VistA as the sole data source.